

Term project: "Measuring Sunset"

Science progresses by making careful observations of nature, developing a working hypotheses that describes the observed phenomena, using that hypothesis to make predictions about nature, and finally querying nature again to test the predictions. If nature agrees with the predictions, the hypothesis gains support. If the hypothesis gains enough support, it may be elevated to the status of scientific theory. However, if nature disagrees with the predictions, the hypothesis must either be revised or scrapped. As scientists, we believe that, over time, the nature of the entire universe can be uncovered through application of these methods.

An observation that has been made is that the Sun sets at different locations on the horizon at different times of the year. We are going use a theoretical model of the Earth/Sun system to predict the exact location of sunset. Over the course of the semester, we will measure the azimuth of sunset and track how it changes over time. Towards the end of the semester, we will compare our observational data to the ***theoretical*** values provided by a mathematical model. The mathematical model comes from our hypothesis that the Sun is at the center of the Solar System, the Earth is in orbit around it, and further, the Earth's rotational axis is tilted with respect to the plane of its orbit.

How to make an observation

!!!NEVER LOOK DIRECTLY AT THE SUN!!!

1. Pick a location that gives you a clear view of the western horizon. Your data will be better if you use the same location for each observation.
2. Find west using a compass or a local street that you **are positive** runs east/west.
3. Pick a landmark on the horizon that is as close to due west as possible. Use this landmark every time you observe so that you don't have to relocate west for every observation.
4. Using your ruler, measure the angle between due west and your landmark. Record this number on your data sheet.
4. To make an observation of sunset, wait until it has just sunk below the horizon, noting its final. **DO NOT LOOK DIRECTLY AT THE SUN.**
5. Use your ruler to measure the angle between your landmark and sunset.
6. Use the sheet provided on the web page (an example appears here) to record your observation including the date, time, ruler reading, actual azimuth, and any comments about the current conditions (cloudy, clear, hazy etc.)

It's important to make regular observations throughout the semester. At the end, you should have AT LEAST 10 observations. To encourage you to make regular observations, we will have three turn in times. They will be as follows:

Turn in number 1:

During lab the week of March 2nd, turn in at least three observations.

Turn in number 2:

During lab the week of April 13th, turn in at least six TOTAL observations.

Final turn in:

The last day of class. 10 total observations and final report.

You will receive further instructions regarding the final report later in the semester. For now, go out and get some observations!

